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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,299	10/15/2003	Ziming He		7922

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EXAMINER	
CAO, HUEDUNG X	

ART UNIT	PAPER NUMBER
2821	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/687,299	HE ET AL.	
	Examiner	Art Unit	
	Huedung X. Cao	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18,20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/15/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over BUTSCHER (4,605,933) in view of LEE (6,839,028) and further in view of OKA et al. (US 5,907,308).

As per claim 1, Butscher teaches the claimed "antenna" (Butscher, the microstrip patch antenna in figure 3 comprising a dielectric 36 sandwiched between the conductive ground 12 and the planar radiating disk 20) comprising: "a planar ground plane" (Butscher, the conductive ground plane 12; column 3, lines 15-17); "radiating element parallelly disposed above the ground plane with predetermined distance" (Butscher, the radiating disk 20; column 3, lines 12-15); "a plurality of dielectric supporting portions disposed between the ground plane and the radiating element for supporting the radiating element" (Butscher, the high dielectric spacer 36 and the collar 22; column 3, lines 15 and 20); "a match tab electrically connected with the radiating element" (Butscher, the matching tab 24 which is extending from the lower ground plane 12 and couples with the radiating disk 20 to provide a desired antenna impedance matching; column 3, line 21); and "a feeder cable" (Butscher, the coaxial feed line attached to the

launcher 28, figure 3) comprising an inner conductor electrically and mechanically connecting with the match tab (Butscher, the feed line 30 connected to the disk 20 and the impedance matching tab 24 which is extending from the lower ground plane 12 and couples with the radiating disk 20 to provide a desired antenna impedance matching; column 2, lines 55-57) and an outer shield conductor electrically and mechanically connecting with the ground plane" (Butscher, column 2, lines 63-66). It is noted that Butscher does not teach a "patch" antenna as claimed. Lee teaches that a "patch" antenna is well known in the art (Lee, column 5, lines 23-30; the antenna components are arranged as patches in a dielectric; the radiating 204a, the connecting patch 202 and the matching tab 204b are formed in a metal sheet in which the inner conductor of the feed cable electrically connecting with the matching tab element). It would have been obvious to arrange the microstrip antenna as a patch antenna to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14). Furthermore, Butshcer and Lee do not disclose the inner conductor of the feed cable directly mechanically connecting with the matching tab element. Oka teaches that the inner conductor of the feed cable directly mechanically connecting with the matching tab element is well known in the art (Oka, see figure 2). It would have been obvious to arrange the inner conductor of the feed cable mechanically connecting with the matching tab to adjust the resonance frequency of the receiving signal.

Claim 2 adds into claim 1 "the ground plane comprises a main ground plane" (Butscher, the ground plane 12), "a sub-ground plane disposed above the main ground

plain" (Butscher, the ground plane 14) and "a shorted strap for connecting the sub-ground plane to the main ground plane" (Butscher, the conducting strap 37; figure 3).

Claim 3 adds into claim 2 "the cable outer shield conductor is electrically connected with the sub-ground plane" (Butscher, the shielding of the feed line couples to the ground plane 14; column 2, lines 65-66).

Claim 4 adds into claim 3 "the sub-ground plane is coplanar with the match tab" which Butscher does not teach. Butscher only teaches that the sub-ground plane 14 is co-plannar with the radiating disk 20. However, Lee teaches that the arrangement of "the radiating patch to be coplanar with the match tab" (therefore the sub-ground plane is co-planar with both the radiating disk and the match tab) is well known in the art (Lee, the coplanar radiating element 204a and the match tab 204b; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to arrange the ground plane and the match tab in a co-planar manner to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

Claim 5 adds into claim 4 "the match tab and the radiating element are formed by one metal sheet" which Butscher does not teach. However, Lee teaches that the arrangement of "the match tab and the radiating element are formed by one metal sheet" is well known in the art (Lee, the coplanar radiating element 204a, the conductive patch 202, and the match tab 204b are formed by one metal sheet; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to form the ground plane and the match tab in one metal sheet to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

Claim 6 adds into claim 1 "said radiating element and match tab are coplanar" which Butscher does not teach. However, Lee teaches that the arrangement of "said radiating element and match tab in a coplanar manner" is well known in the art (Lee, the coplanar radiating element 204a and the match tab 204b; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to arrange the ground plane and the match tab in a co-planar manner to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

As per claim 7, Butscher teaches the claimed "antenna for an electronic device" (Butscher, the microstrip patch antenna in figure 3 comprising a dielectric 36 sandwiched between the conductive ground 12 and the planar radiating disk 20) comprising: "a palannar metal sheet" (Butscher, the radiating disk 20; column 3, lines 12-15); "a first ground plane disposed adjacent to the metal sheet" (Butscher, the ground plane 14 disposed adjacent to a metal sheet of the radiating disk 20); "a second ground plane parallelly spaced from the metal sheet a predetermined distance" (Butscher, the conductive ground plane 12 parallelly spaced from the disk 20; column 3, lines 15-17); "a plurality of dielectric supporting portions disposed between the metal sheet and the second ground plane to support the metal sheet" (Butscher, the high dielectric spacer 36 and the collar 22; column 3, lines 15 and 20); "a shorted patch connecting the first ground plane to the second ground plane" (Butscher, the conducting strap 37); and "a feeder cable" (Butscher, the coaxial feed line attached to the launcher 28, figure 3) comprising an outer shield conductor electrically and mechanically connecting with the ground plane" (Butscher, column 2, lines 63-66). It is noted that

Butscher does not teach a "patch" antenna as claimed. Lee teaches that a "patch" antenna is well known in the art (Lee, column 5, lines 23-30; the antenna components are arranged as patches in a dielectric). Butscher also does not teach "planar metal sheet comprising a first element, a second element and a connecting patch connecting the first element with the second element" as claimed. Lee teaches that such planar metal sheet comprising the radiating element, the matching tab and the connecting patch is well known in the art (Lee, the radiating 204a, the connecting patch 202 and the matching tab 204b are formed in a metal sheet in which the inner conductor of the feed cable electrically connecting with the matching tab element). It would have been obvious to arrange the microstrip antenna as a patch antenna with a plannar metal containg the radiating element, conductive patch and the matching tab to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14). Furthermore, Butshcer and Lee do not disclose the inner conductor of the feed cable mechanically connecting with the matching tab element. Oka teaches that the inner conductor of the feed cable directly mechanically connecting with the matching tab element is well known in the art (Oka, see figure 2). It would have been obvious to arrange the inner conductor of the feed cable mechanically connecting with the matching tab to adjust the resonance frequency of the receiving signal.

Claim 8 adds into claim 7 "the first ground plane is coplanar with the metal sheet" which Butscher does not teach. Butscher only teaches that the sub-ground plane 14 is co-plannar with the radiating disk 20. However, Lee teaches that the arrangement of "the radiating patch to be coplanar with the match tab" (therefore the sub-ground plane

is co-planar with both the radiating disk and the match tab) is well known in the art (Lee, the coplanar radiating element 204a and the match tab 204b; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to arrange the ground plane and the match tab in a co-planar manner to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

Claim 9 adds into claim 8 "the feeder cable lies on the first ground plane" which Butscher teaches in figure 3 (Butscher's feed line 30 lies on the ground plane 14).

Claim 10 adds into claim 9 "the first and second elements are both rectangular" which Butscher does not teach. However, Lee teaches that the shape of "the radiating patch and the match tab" are rectangular is well known in the art (Lee, the coplanar radiating element 204a and the match tab 204b; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to arrange the ground plane and the match tab in rectangular shape to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14, column 5, lines 44-46).

Claim 11 adds into claim 7 "the first element and the second element ate coplanar with each other" which Butscher does not teach. However, Lee teaches that the arrangement of "said radiating element and match tab in a coplanar manner" is well known in the art (Lee, the coplanar radiating element 204a and the match tab 204b; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to arrange the ground plane and the match tab in a co-planar manner to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

As per claim 12, Butscher teaches the claimed "antenna for an electronic device" (Butscher, the microstrip patch antenna in figure 3 comprising a dielectric 36 sandwiched between the conductive ground 12 and the planar radiating disk 20) comprising: "a first element" (Butscher, the radiating disk 20; column 3, lines 12-15); "a second element wherein the connection patch has a characteristic impedance same as that of the input impedance of the second element" (Butscher, the matching tab 24); "a ground portion disposed adjacent to the first element" (Butscher, the ground plane 14 disposed adjacent to a metal sheet of the radiating disk 20); and ""a feeder cable" (Butscher, the coaxial feed line attached to the launcher 28, figure 3) comprising an inner conductor electrically and directly mechanically connecting with the first element and an outer shield conductor electrically connecting with the ground plane" (Butscher, column 2, lines 63-66). It is noted that Butscher does not teach a "patch" antenna as claimed. Lee teaches that a "patch" antenna is well known in the art (Lee, column 5, lines 23-30; the antenna components are arranged as patches in a dielectric). Butscher also does not teach "a connecting patch connecting the first element with the second element" as claimed. Lee teaches that such planar metal sheet comprising the radiating element, the matching tab and the connecting patch is well known in the art (Lee, the radiating 204a, the connecting patch 202 and the matching tab 204b are formed in a metal sheet in which the inner conductor of the feed cable electrically connecting with the matching tab element). It would have been obvious to arrange the microstrip antenna as a patch antenna with a plannar metal containg the radiating element,

conductive patch and the matching tab to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

Claim 13 adds into claim 12 "a plurality of dielectric supporting portions are disposed between the metal sheet and the ground portion to support the metal sheet" (Butscher, the high dielectric spacer 36 and the collar 22; column 3, lines 15 and 20).

Claim 14 adds into claim 13 "the first element, the second element and the connecting patch are formed in one metal sheet" which Butscher does not teach. Lee teaches that such planar metal sheet comprising the radiating element, the matching tab and the connecting patch is well known in the art (Lee, the radiating 204a, the connecting patch 202 and the matching tab 204b are formed in a metal sheet in which the inner conductor of the feed cable electrically connecting with the matching tab element). It would have been obvious to arrange the microstrip antenna as a patch antenna with a plannar metal containg the radiating element, conductive patch and the matching tab to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

Claim 15 adds into claim 14 "the ground portion comprises an upper ground plane" (Butscher, the ground plane 14 disposed adjacent to a metal sheet of the radiating disk 20), "lower ground plane" (Butscher, the conductive ground plane 12 parallelly spaced from the disk 20; column 3, lines 15-17) and "a short patch connecting the upper ground plane to the lower ground plane" (Butscher, the conducting strap 37).

Claim 16 adds into claim 15 "the outer shield conductor electrically connects with the upper ground plane" " (Butscher, column 2, lines 63-66).

Claim 17 adds into claim 16 "the metal sheet is parallel to the lower ground plane" which Butscher does not explicitly teach. Butscher only teaches the radiating disk 20 is on a metal sheet parallel to the lower ground plane (figure 3), but does not teach the matching tab is also on the metal sheet "parallel to the lower ground plane". However, Lee teaches that the arrangement of "the match tab and the radiating element are formed by one planar metal sheet" is well known in the art (Lee, the coplanar radiating element 204a, the conductive patch 202, and the match tab 204b are formed by one planar metal sheet; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to form the ground plane and the match tab in one planar metal sheet parallel to the ground plane to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

Claim 18 adds into claim 12 "said first element and said second element are coplanar with each other" which Butscher does not teach. However, Lee teaches that the arrangement of "said radiating element and match tab in a coplanar manner" is well known in the art (Lee, the coplanar radiating element 204a and the match tab 204b; figure 2, column 5, lines 38-40; column 7, lines 56-62). It would have been obvious to arrange the ground plane and the match tab in a co-planar manner to have the antenna model with low profile, easy fabrication and low cost (Lee, column 3, lines 7-14).

Claim 20 adds into claim 1 "the match tab indirectly mechanically connected with the radiating element via a connecting patch which is not grounded to the ground plane (Lee, the radiating 204a, the connecting patch 202 and the matching tab 204b).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huedung Cao whose telephone number is (571) 272-1939.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong, can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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